

V. Jones

## HANDOUT FOR ALAMEDA COUNTY SUBCOMMITTEE MEETING

June 25, 1979

## Alternative Facility Implementation Scenarios

no flps

[Alameda County Solid Waste  
Management Authority]

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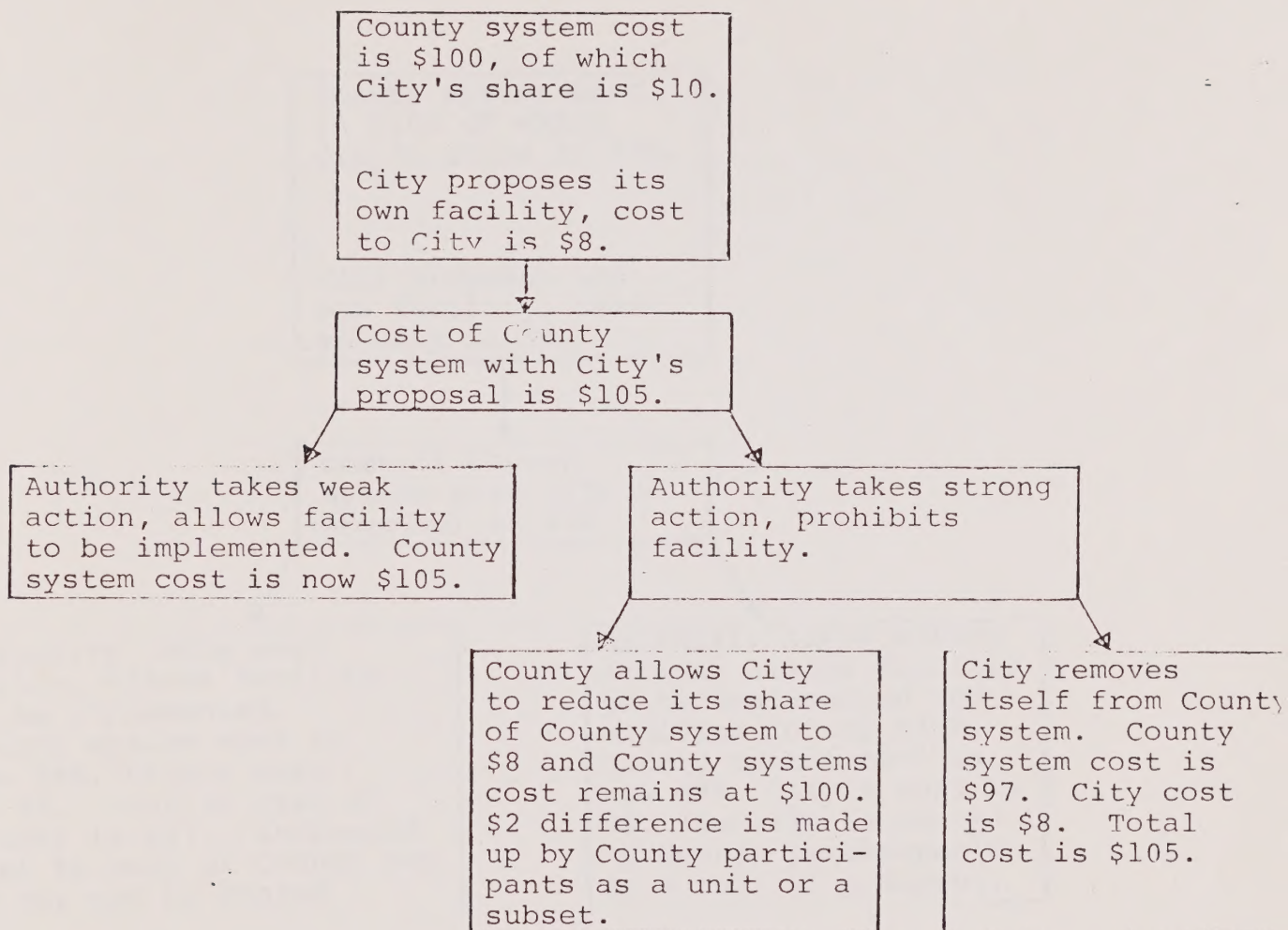
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## SCENARIO 2





County system cost  
is \$100 of which  
City's share is \$10.


City proposes its  
own facility, cost  
to City is \$8.

Cost of County  
system with City's  
proposal is \$99.

Authority takes weak  
action, allows facility  
to be implemented.  
County system cost is  
now \$99, City's cost  
is \$8. Cost to rest of  
County is \$91. Increased  
cost to rest of County may  
or may not be shared.

Authority takes strong  
action, allows facility  
to be implemented and  
modifies County Plan.  
County system cost is  
now \$99, City's cost is  
\$8. Benefit is shared  
by County participants  
as a unit or a subset.

### SCENARIO 3



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"County system" is defined in the plan. A separate cost definition is presented for each "County system" of:

Transfer (a \$100 system defined in 10/78 plan)  
Recovery (a \$100 system defined in 10/78 plan)  
Energy (a \$100 system defined in 10/78 plan)  
Disposal (a \$100 system defined in 10/78 plan)

Strength of definitions (cost in 10/78)

Transfer - strong  
Recovery - weak  
Energy - weak  
Disposal - average

Due to short-term actions of Authority, transfer system defined in 10/78 will have to be changed to include Davis Street.





## Management and Financing Alternatives

In order to effect the efficient and economical management and financing of the proposed facilities, it is necessary to recognize at the outset that the purpose of regionalization, and thus the creation of the Alameda County Solid Waste Management Authority, must be to promote the most cost-effective method of solid waste management within the county and share the cost savings, over individual disposal, with each participating jurisdiction in an equitable manner. This implies that management and financing alternatives must be considered in the light of what is most efficient and economical for the region as a whole.

For the purposes of this discussion, and to be consistent with the Solid Waste Management Plan, it is assumed that the individual jurisdictions are responsible for collection services, and thus the regional solid waste management responsibility will be limited to disposal and resource recovery.

### Transfer Stations

There are three general management/financing alternatives for the transfer station network. They are:

1. Public ownership and operation
  - a. The Authority can finance and operate the transfer stations.
  - b. The jurisdiction within whose boundaries the transfer station is located can finance and operate the transfer stations.
  - c. A combination of the above. Some transfer stations could be owned and operated by the Authority while others could be owned and operated by local jurisdictions.

The passage of Proposition 13 has essentially precluded the issue of general obligation bonds and thus there would be no financial cost savings effected by the financing of a transfer station by a local jurisdiction rather than the Authority. Other factors such as availability of staff, operating and maintenance costs, ability to finance, and local political factors would determine which of the above public management and financing alternatives was most appropriate.



Table 1. Management/Financing Alternatives for Transfer Station Operation

Management/Financing Alternative	Advantages	Disadvantages
1. JPA <sup>a</sup> financed and managed	<ol style="list-style-type: none"> <li>1. Low interest cost.</li> <li>2. Total control of operation.</li> </ol>	<ol style="list-style-type: none"> <li>1. Requires establishment of JPA operating department and hiring of personnel.</li> </ol>
2. JPA financed and privately managed	<ol style="list-style-type: none"> <li>1. Low interest cost.</li> <li>2. Expertise in operation.</li> </ol>	<ol style="list-style-type: none"> <li>1. Assumption of financial risk.</li> <li>2. Limited control of cost and service.</li> <li>3. Difficult to implement policies over total service area.</li> </ol>
3. Privately managed and financed	<ol style="list-style-type: none"> <li>1. No financial risk.</li> <li>2. Greater expertise in operation.</li> <li>3. No burden on debt limitations.</li> </ol>	<ol style="list-style-type: none"> <li>1. Higher capital costs</li> <li>2. Limited control over costs and service.</li> <li>3. Difficult to implement uniform policies over total service area.</li> </ol>

<sup>a</sup>JPA - Joint Powers Authority. Refers to the Alameda County Solid Waste Management Authority.





2. Public ownership and private operation. Either the Authority or the local jurisdiction within whose boundaries the transfer station is located can finance the capital costs associated with the transfer station network and lease these facilities, at lease payments equal to the debt service requirements, to a private operator. The transfer stations will not be a part of the collection rate base and the franchise will not earn a rate of return on these facilities.
3. Private ownership and operation. The Authority can allow the franchised refuse collectors to both finance and operate the transfer stations as part of franchising the collection, transfer and disposal system. In this case, the transfer stations will be included in the rate base and the franchisee will earn a return on these assets.

Another alternative is a combination of public ownership and operation, private ownership and operation, and public ownership and private operation as might be appropriate and feasible for each transfer station.

The advantages and disadvantages of each of the above management/financing alternatives are summarized in Table 1. Whichever alternative is chosen, it is recommended that collection costs in each jurisdiction be separated from transfer and disposal costs. The latter costs are necessarily a function of the location and capacity of the transfer stations. The location and capacities of these transfer stations have been determined such that the total costs of transfer are a minimum. Therefore, the benefit of this minimization of transfer and disposal costs should be shared by the residents of all jurisdictions.

In addition, provision should be made for the future change in any management/financing alternatives. Circumstances (convenience, political conditions, etc.) favoring one alternative at present may change significantly in the future such as to favor another alternative. Specifically, current conditions might favor the ownership and management of the facilities by either the various jurisdictions, private industry or combinations thereof. In the future, however, the Authority may desire to (and at the same time be in the position to) assume a more active management role. Therefore, it is recommended that whichever management/ownership alternative is adopted in the near future, specific provision be made for the possible future transfer (through purchase) of ownership and/or operation to the Authority.



## Methods of Cost Allocation

As indicated above, a major consideration of the regional solid waste management program should be the allocation of the costs/benefits associated with the regional facilities among the participating jurisdictions. To this end, we propose two viable allocation methods. These methods are based on (1) the level of solid waste generation (the so-called utility method), and (2) the cost of each jurisdiction disposing of its solid waste individually with a rebate proportional to level of solid waste generation.

Cost Sharing Method 1. This method allocates transfer station costs (less total income from the labor intensive resource recovery) to each jurisdiction based on the volume of solid waste generation. In symbolic notation, the regional cost/benefit allocated to jurisdiction "i",  $C_i$  can be expressed as:

$$C_i = r_i C_r$$

where  $r_i$  is the percentage contribution of solid waste by user "i" and is defined by the relation

$$r_i = P_i / \sum_{i=1}^{16} P_i$$

$P_i$  is the solid waste contribution of user "i" and  $C_r$  is the total cost benefit of the transfer station network.

Cost Sharing Method 2. This method is based on the cost of each jurisdiction disposing of its solid waste individually, with a rebate of a portion of the cost savings resulting from regionalization proportional to the amount of solid waste contributed to the regional system. In this method, each jurisdiction realizes some of the savings resulting from regionalization. In symbolic notation, the cost to each jurisdiction can be expressed as:

$$C_i = C_{iI} - Y_i \Delta C_{iI}$$

where  $C_{iI}$  is the cost for jurisdiction "i" to disposal of its solid waste individually;  $\Delta C_{iI}$  is equal to 16

$$\sum_{i=1}^{16} C_i - C_r$$

the difference in cost between each jurisdiction disposing individually and regionally; and  $r_i$  is the percentage of solid waste contributed by jurisdiction "i" and is defined above in Method 2.

The central premise in each of these allocation alternatives is that each jurisdiction participating in the regional disposal and recovery system should share in the economic benefits of the regionalization of the system. This could necessitate fund transfer between transfer station operators (should they be different jurisdictions or franchises) and between transfer station operators and collection operators (should they be different).





## Financing Costs

The financing costs associated with the various methods of financing are shown in Table 2. The results of this table assume that the total cost of the transfer stations is financed via a single bond issue. If individual transfer stations or groups of transfer stations were financed by separate bond issues, the effect costs would be slightly higher as a result of increased engineering, legal and printing costs.

## Central Resource Recovery Facility

The central resource recovery facility could be owned and operated by either the owner/operator of the South Oakland transfer station or by separate owner/operator arrangement. Three practical management/financing alternatives exist for the capital intensive central resource facility. These are:

- . Private Ownership and Operation with Both Debt and Equity Raised from Private Sources. In this case, the private owner/operator would have total responsibility for the operation of the central resource recovery facility. This would most likely require a long-term contract with the private operator including a provision for profit sharing between operator and the Authority jurisdictions. In addition, the private operator would be responsible for raising from private sources both debt and equity capital.

- . Private Ownership and Operation with Debt Raised by Tax-Exempt Financing. The Authority or a participating jurisdiction can finance a portion of the capital-related costs through the issuance of municipal revenue bonds and lease, with the benefits of ownership, to a private operator. Lease payments would be equal to debt service. The remaining portion could be financed via an equity participation by the private operator. Again, a long-term agreement between the Authority/local jurisdictions and private operator guaranteeing waste stream and specifying profit sharing of any recovered resource and energy profits may be required.

Because there is some question concerning the legality of a public agency issuing tax-exempt debt on the behalf of a private jurisdiction (even if benefits accrue to residents of the public jurisdiction), a variation of the above would be that the debt portion is provided by the issuance of solid waste revenue bonds by the California Pollution Control Financing Authority (CPCFA).

- . Public Ownership and Operation. Here the Authority or a participating jurisdiction both finances and operates the recovery facilities. The possibility of contracting with a private operator to operate the facilities without the benefit of ownership also exists. Although the cost of capital would be low, depending on the recovery process and facilities, the necessary technical expertise might not be available within the Authority/jurisdiction.



Table 2. Financing Costs for Transfer Stations

Item	Municipal revenue bonds	CPCFA and private equity <sup>a</sup>	Private financing <sup>b</sup>
Face amount of Debt Issue			
Project cost	14,000,000	11,200,000	9,800,000
Underwriting commission	410,000	168,000	196,000
Bond council	50,000	25,000	25,000
Printing costs	30,000	10,000	25,000
Reserve requirements <sup>c</sup>	1,412,150	1,180,375	1,329,370
Engineering report	30,000	20,000	30,000
Total issue	15,932,150	12,603,375	11,405,370
Proceeds to JPA	14,000,000	11,200,000	9,800,000
Cost <sup>d</sup>			
G.O. bonds at 6 percent	-	-	-
Revenue at 6.30 percent	1,412,150	-	-
CPCFA at 7 percent	-	1,180,375	-
Private debt at 10 percent	-	-	1,329,370
Equity at 16 percent <sup>e</sup>	-	448,000	672,000
Total annual cost	1,412,150	1,628,375	2,001,370
Effective cost, percent <sup>f</sup>	10.09	11.63	14.30

<sup>a</sup>Assumes 80/20 debt/equity ratio.<sup>b</sup>Assumes 70/30 debt/equity ratio.<sup>c</sup>One year debt service.<sup>d</sup>Assumes semi-annual payments for 20 years.<sup>e</sup>Assumes no issue cost for equity.<sup>f</sup>Weighted cost.





Again, as in the case of the transfer stations, the benefits to be derived from the operation of a central resource facility are to be considered regional and should be allocated throughout the county commensurate with waste generation and without regard to location. The advantages and disadvantages of each of the above management/financing alternatives for the resource and energy recovery plans are summarized in Table 3. The effective cost of capital for each financing alternative is shown in Table 4.

#### Authority Administration

Whichever management/financing alternative(s) is selected, the Authority must provide the engineering, financial and administrative staff necessary to either operate the solid waste management system, if that alternative is selected, or oversee the management of the system by the other jurisdictions and/or private industry. In the latter case, staff would insure that all facilities and operations are in conformance with the Authority Plan and that the benefits accrue in an equitable manner to all recipients of service in all jurisdictions. The costs of developing a staff for the Authority have not been included. Once a management technique has been selected by the Authority, the approximate costs of staffing that effort will be estimated.



Table 3. Management/Financing Alternatives for Resource Recovery

Management/financing alternative	Advantages	Disadvantages
1. Private ownership and operation with private equity and debt.	<ol style="list-style-type: none"> <li>1. Limited risk</li> <li>2. Technical expertise</li> <li>3. No burden on municipal debt limits</li> </ol>	<ol style="list-style-type: none"> <li>1. High cost of capital</li> <li>2. Limited control</li> </ol>
2. Private ownership and operation with private equity and tax exempt debt.	<ol style="list-style-type: none"> <li>1. Low cost of capital</li> <li>2. Technical expertise</li> <li>3. Limited risk</li> <li>4. No burden on municipal debt limits</li> </ol>	<ol style="list-style-type: none"> <li>1. Limited control</li> </ol>
3. Public ownership and operation.	<ol style="list-style-type: none"> <li>1. Low cost of capital</li> <li>2. Total control</li> </ol>	<ol style="list-style-type: none"> <li>1. Requires staffing of in-house capability</li> </ol>





Table 4. Financing Costs for Materials Recovery/Energy  
Production Facilities

Item	Municipal revenue bonds	CPCFA and private equity <sup>a</sup>	Private <sup>b</sup> financing <sup>b</sup>
Face amount of Debt Issue			
Project cost	21,000,000	16,800,000	14,700,000
Underwriting commission	630,000	252,000	294,000
Bond council	50,000	25,000	25,000
Printing costs	40,000	15,000	30,000
Reserve requirement <sup>c</sup>	2,116,800	1,769,250	9,437,245
Engineering report	40,000	30,000	40,000
Total issue	23,876,280	89,706,400	80,967,245
Proceeds to JPA	21,000,000	16,800,000	14,700,000
Cost <sup>d</sup>			
G.O. bonds at 6 percent	-	-	-
Revenue at 6.30 percent	2,116,800	-	-
CPCFA at 7 percent	-	1,769,250	-
Private debt at 10 percent	-	-	1,990,753
Equity at 16 percent <sup>e</sup>	-	672,000	1,008,000
Total annual cost <sup>f</sup>	2,116,800	2,441,250	2,998,753
Effective cost, percent	10.07	11.63	14.28

<sup>a</sup> Assumes 80/20 debt/equity ratio.

<sup>b</sup> Assumes 70/30 debt/equity ratio.

<sup>c</sup> One year debt service.

<sup>d</sup> Assumes semi-annual payments for 20 years.

<sup>e</sup> Assumes no issue cost for equity.

<sup>f</sup> Weighted cost..



## Labor Intensive

### Resource Recovery at Transfer Stations

Resource recovery operations can be undertaken at each of the transfer stations. The analysis presented herein is predicated on the following assumptions:

- 1) Transfer stations are designed primarily for the efficient movement of refuse from collection vehicles to long haul transport vehicles.
- 2) There are inherent health and safety problems in sorting through the compacted waste from collection vehicles. Therefore, wastes collected in compactor vehicles from residential, commercial and light wastes sources will not be processed in any labor intensive resource recovery projects.
- 3) The primary waste sources available for resource recovery are wastes delivered to the station by the public and uncompacted material delivered to the transfer station in drop boxes.
- 4) It is assumed that 20 percent of the capacity of each transfer station is available to labor intensive resource recovery.
- 5) One man can process approximately 26 tons of waste per day and approximately 10 percent of that material can be recovered. Expected composition of recovered materials is:

Light ferrous fraction	66%
Heavy ferrous fraction	30%
Aluminum	2%
Other mixed bulky scrap	2%

- 6) Annual wage requirements are \$16,000/man/year.

The quantities of waste available for sorting at the various transfer stations and the manpower requirements are presented below.

<u>Transfer Station</u>	<u>Sortable Waste Quantities TPD</u>	<u>Manpower Requirements</u>
North Oakland	160	7
South Oakland	120	5
Hayward	170	7
Fremont	110	4
Pleasanton	<u>70</u>	<u>3</u>
Total	630	26





Based on the composition given in assumption 5, and 50 percent of the value of recovered material given in Appendix G of the report, the potential value of the recoverable material in Alameda County is given below.

<u>Item</u>	<u>Percentage in Recovered Material</u>	<u>Annual Quantity tons/vr</u>	<u>Unit Value \$/ton</u>	<u>Annual Value millions of dollars</u>
Light ferrous fraction	66	15,000	20	0.30
Heavy ferrous fraction	30	7,000		0.21
Aluminum	2	460	225	0.14
Other mixed bulky scrap	2	460	20	0.01
				<u>0.66</u>

Unit values for recovered materials are only 50 percent of those given in the report since material contamination will occur in the vehicles delivering the waste. Also the amount of material recovered and the frequency of deliveries are not enough to justify premium market prices.

With annual wages at approximately \$400,000, the labor intensive resource recovery system could earn a profit of \$250,000 if the projections given above hold.

Based on 3,170 tons/day of waste in Alameda County, the labor intensive resource recovery project would increase the revenue of resource recovery with the sale of RDF from \$8.80/ton to \$9.00/ton.

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